General

Guideline Title

ACR Appropriateness Criteria® acute nonspecific chest pain — low probability of coronary artery disease.

Bibliographic Source(s)

Hoffman U, Akers SR, Brown RK, Cummings KW, Cury RC, Greenberg SB, Ho VB, Hsu JY, Min JK, Panchal KK, Stillman AE, Woodard PK, Jacobs JE, Expert Panel on Cardiac Imaging. ACR Appropriateness CriteriaÂ® acute nonspecific chest pain - low probability of coronary artery disease. Reston (VA): American College of Radiology (ACR); 2015. 8 p. [56 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Hoffman U, Venkatesh V, White RD, Woodard PK, Carr JJ, Dorbala S, Earls JP, Jacobs JE, Mammen L, Martin ET III, Ryan T, White CS, Expert Panel on Cardiac Imaging. ACR Appropriateness Criteria® acute nonspecific chest pain - low probability of coronary artery disease. [online publication]. Reston (VA): American College of Radiology (ACR); 2011. 6 p. [56 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

ACR Appropriateness Criteria®

Clinical Condition: Acute Nonspecific Chest Pain -- Low Probability of Coronary Artery Disease

Radiologic Procedure	Rating	Comments	RRL*
X-ray chest	9	X-ray, CTA, and US are generally nonoverlapping and can be used sequentially.	☢
CTA coronary arteries with contrast	7	X-ray, CTA and US are generally nonoverlapping and can be used sequentially.	☢☢☢
CTA chest with contrast	7	X-ray, CTA, and US are generally nonoverlapping and can be used sequentially.	☢☢☢
US echocardiography transthoracic resting	7	X-ray, CTA, and US are generally nonoverlapping and can be used sequentially.	O
SPECT MPI rest and stress	6		☢☢☢☢

Radiologic Procedure	Rating	Comments	RRL*
Tc-99m V/Q scan lung	5		☢☢☢
X-ray rib views	5		☢☢☢
MRA chest without and with contrast	5		O
MRI heart stress perfusion without and with contrast	5	This procedure may be appropriate but there was disagreement among panel members on the appropriateness rating as defined by the panel's median rating.	O
MRI heart function and morphology without and with contrast	5	This procedure may be appropriate but there was disagreement among panel members on the appropriateness rating as defined by the panel's median rating.	O
US echocardiography transthoracic stress	5		O
MRA chest without contrast	4		O
X-ray barium swallow and upper GI series	4		☢☢☢
X-ray thoracic spine	4		☢☢☢
US abdomen	4		O
MRI heart function and morphology without contrast	4		O
US echocardiography transesophageal	2		O
Arteriography coronary	1		☢☢☢
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

Introduction/Background

Patients who present to the emergency department (ED) with acute chest pain are stratified according to their probability of developing acute coronary syndrome (ACS) as follows: very low (<1%), low (1%–4%), intermediate (4%–8%), or high (>8%) probability.

This document outlines the usefulness of available diagnostic imaging for those patients without known coronary artery disease (CAD) and at low probability for having CAD who do not present with classic ACS signs, symptoms, or electrocardiogram (ECG) abnormalities, but rather with nonspecific chest pain leading to a differential diagnosis, including aortic, pulmonary, gastrointestinal (GI), or musculoskeletal pathologies. Patients presenting to the ED with signs and/or symptoms of ACS, including those with unstable angina pectoris, non-ST-elevation myocardial infarction, diagnostic ST-segment changes, or elevated cardiac enzymes suggesting myocardial infarction, are not included in this discussion. The evaluation and treatment algorithms for these conditions have been well defined in the Scientific Statements and Practice Guidelines of the American Heart Association and in the National Guideline Clearinghouse (NGC) summary of the American College of Radiology (ACR) Appropriateness Criteria® chest pain, suggestive of acute coronary syndrome.

The following imaging modalities are available in evaluating patients presenting to the ED with low probability of CAD: chest radiography, multidetector computed tomography (MDCT), magnetic resonance imaging (MRI), ventilation/perfusion (V/Q) scans, cardiac perfusion scintigraphy, transesophageal and transthoracic echocardiography, positron emission tomography (PET), spine and rib radiography, barium esophageal and upper GI studies, and abdominal ultrasound. Traditionally, most of these examinations have been performed during the ED visit, but there is a trend to perform outpatient testing.

Variant: Acute Nonspecific Chest Pain—Low Probability of Coronary Artery Disease

Chest Radiography

The chest radiograph is the recommended initial imaging study. Chest radiographs can help identify potential sources of previously undifferentiated

chest pain such as pneumothorax, pneumomediastinum, fractured ribs, acute and chronic infections, and malignancies. Other conditions producing chest pain, such as pulmonary emboli (PE), can be suspected from the chest radiograph, but the overall sensitivities are low. Thoracic calcifications, if present, may indicate pericardial disease, ventricular aneurysm, intracardiac thrombi, or aortic disease. Although chest radiographs are often normal for the presence of PE, the presence of a Hampton hump, Westermark sign, or pulmonary artery enlargement can suggest PE. Mediastinal air can indicate a ruptured viscus or subpleural bleb or other acute pathology. In addition, widening of the mediastinum or an enlarged heart or aortic knob, as well as ill-defined aortic boundaries, can establish a differential diagnosis of acute aortic syndrome.

Multidetector Computed Tomography

Coronary computed tomography angiography (CCTA): Both prospectively (mean radiation exposure, 3 [range, 1–5] mSv) and retrospectively (mean radiation exposure, 10 [range, 8–12] mSv) ECG-synchronized cardiac CT permits comprehensive assessment of aortic, coronary, and other causes of chest pain. Most importantly, in this low-risk population, cardiac CTA accurately detects and characterizes the presence and extent of CAD and has nearly perfect negative predictive value to rule out significant CAD.

Additional assessment of global and regional left ventricular function and wall motion adds significant incremental value. MDCT is also the primary method for diagnosing coronary anomalies, a rare cause of acute chest pain.

Recent advances in cardiac CT imaging technology allow for further radiation dose reduction in CCTA examinations; new and available dose-reducing techniques include prospective triggering, adaptive statistical iterative reconstruction, and high-pitch spiral acquisition. However, these new lower-dose techniques may not be appropriate in all patients due to their dependency on a combination of factors, including heart rate, rhythm, and large body size. Thus, although these techniques are promising in terms of reducing patient radiation dose, there may be patients for whom these radiation dose techniques are not optimal, such as an obese, elderly patient with an arrhythmia who might best benefit from retrospective gating in order to allow assessment of the coronary arteries at multiple phases of the cardiac cycle. In addition, not all scanners are capable of all radiation dose reduction techniques. In all cases, the imaging physician must select the appropriate combination of imaging parameters to acquire a diagnostic examination at a radiation dose that is as low as reasonably achievable. The proper application of these new lower-dose techniques is scanner dependent and may depend on low heart rate (<65 beats per minute [bpm]) and sinus rhythm. However, some scanners allow heart-rate–independent use of low-radiation protocols.

Chest CTA is the state-of-the-art method for detection of PE. In addition, chest CTA has excellent accuracy in demonstrating noncardiac causes of chest pain, including pneumothorax, pneumonia, malignancies, pulmonary airspace abnormalities, and interstitial lung disease. Pericardial effusions, thickening, and/or calcifications are seen far more readily than with radiographs alone, and more importantly, other symptom-producing pathologies such as ventricular aneurysms and cardiac thrombi or tumors can be detected. Pulmonary nodules represent >75% of incidentally detected findings.

With advanced CT technology, it is possible to perform a single-phase triple rule-out examination allowing comprehensive assessment of CAD, aortic dissection (AD), and PE by covering the entire thorax while enhancing both the aortic and pulmonary vascular tree. The newest developments in CT technology permit this exam with minimally increased radiation exposure and contrast administration. Hence, such protocols can be useful in selected patients, especially those in whom ED physicians consider ACS as a secondary differential after PE has been ruled out. At this point, there are not enough data to conclude whether such practice would be efficient.

Transthoracic and Transesophageal Echocardiography

Transthoracic and transesophageal echocardiography, with or without pharmacologic stress, are frequently used to define abnormalities of ventricular wall motion as an indicator of cardiac disease. In addition, echocardiography can readily demonstrate pericardial effusion, valve dysfunction, and cardiac thrombus. Aortic pathology can be identified, but the findings of intramural hematoma, dissection, pulmonary embolus, and aneurysm are better seen with MDCT or MRI. Most importantly, transthoracic echocardiography without stress is a low-risk screening examination with high negative predictive value for ACS.

Magnetic Resonance Imaging

Magnetic resonance angiography (MRA) of the chest can be performed with either noncontrast (e.g., time-of-flight, balanced steady-state free precession, phase-contrast, black-blood) or contrast-enhanced (e.g., 3-dimensional [3D] arterial-phase fast gradient-echo) protocols that are useful in identifying vascular pathology. These techniques can be used to identify aortic pathology and in specific scenarios can be used to evaluate for pulmonary artery pathology. Cardiac MRI is typically more time-consuming and less available in the ED setting. Its strength lies primarily in the assessment of myocardial ischemia, edema, and infarction in patients with known CAD. In addition, cardiac MRI can be used in the imaging assessment for acute myocarditis as a cause of chest pain. Cardiac MRI has not been well studied in low-risk undifferentiated chest pain populations and is uncommonly used in the emergency setting because of the relatively long scan times and its inability to detect CAD and PE with reasonable efforts. The benefits of cardiac MRI, both with and without pharmacologic stress, in acute nonspecific chest pain, with the exception of

patients in whom myocarditis is suspected, is likely of limited use.

Radiography of the Ribs, Cervical Spine, or Thoracic Spine

Rib or spine radiographs are indicated in patients with a clinical suspicion of skeletal pathology.

Radionuclide Studies

Radionuclide myocardial perfusion studies at rest, but more typically at stress, followed by rest examinations in those with positive stress with technetium 99m sestamibi, or tetrofosmin are frequently used in identifying perfusion abnormalities as an indicator of ischemic chest pain, especially when a cardiac etiology is suspected. A normal stress perfusion scan can be used to exclude the diagnosis of CAD in patients in whom myocardial infarction by enzymes has been ruled out.

PET is an alternative method for evaluating myocardial perfusion deficits, using N-13 ammonia or rubidium 82 agents. However, PET is not indicated in low-probability patients.

V/Q lung scintigraphy can be used in patients with clinically suspected PE, but this study has been largely replaced by MDCT.

Cardiac Catheterization

Cardiac catheterization with coronary digital subtraction angiography remains the gold standard in demonstrating CAD and can permit immediate therapeutic intervention. However, there is rarely an indication to use it in low-probability patients because of the unfavorable risk benefit ratio (0.46% major complication rate in diagnostic angiography, consisting of 0.13% death, 0.06% MI, 0.08% stroke, 0.07% major bleeding [>2 units], and 0.12% severe renal failure [>50% decrease in glomerular filtration rate [GFR]). This has become more relevant with the availability of CCTA, with its high negative predictive value to exclude CAD.

Barium Swallow or Endoscopy

Esophageal disorders can be the cause of chest pain. A water-soluble or barium contrast upper GI swallowing study or endoscopy can be helpful in establishing esophageal spasm or reflux as an etiology of the chest pain.

Abdominal Ultrasonography

Abdominal ultrasound (US) may be indicated to document cholecystitis as a cause for the chest pain. US is also helpful in evaluating pancreatitis, other solid-organ pathology, intra-abdominal abscesses and fluid collections, and, less frequently, GI pathology.

Summary of Recommendations

- This document applies to patients at low risk for CAD who present with undifferentiated chest pain and without signs of ischemia in which a chest radiograph is almost universally obtained.
- Functional testing with exercise-based ECG, echocardiography, or low-dose single-photon emission CT (SPECT) myocardial perfusion imaging (MPI) can be conducted to exclude myocardial ischemia after rule-out of MI by consecutive troponin measurements, especially in patients with high exercise capacity.
- Cardiac CT, owing to its high negative predictive value, is a viable alternative to functional testing, and is increasingly used in the evaluation of coronary disease in this population and can be incorporated into the workup algorithm of those with low-probability chest pain.
- Triple-rule-out CT (CAD, PE, and AD) has become more technically feasible and can be helpful in selecting patients, but evidence is not conclusive whether this will improve efficiency of patient management.
- A number of diagnostic tests, among them US of the abdomen, MRA of the aorta with or without contrast, x-ray rib views, x-ray barium swallow, and upper GI series may also be appropriate to use in evaluating noncardiac causes of chest pain.
- Typically, more invasive imaging tests such as transesophageal echocardiography or coronary angiography, as well as advanced specific cardiac MRI examinations, are rarely indicated in diagnosing low risk nonspecific chest pain.

Abbreviations

- CTA, computed tomography angiography
- GI, gastrointestinal
- MRA, magnetic resonance angiography
- MRI, magnetic resonance imaging
- SPECT MPI, single photon emission computed tomography myocardial perfusion imaging
- Tc, technetium

- US, ultrasound
- V/Q, ventilation/perfusion

Relative Radiation Level Designations

Relative Radiation Level*	Adult Effective Dose Estimate Range	Pediatric Effective Dose Estimate Range
O	0 mSv	0 mSv
☢	<0.1 mSv	<0.03 mSv
☢☢	0.1-1 mSv	0.03-0.3 mSv
☢☢☢	1-10 mSv	0.3-3 mSv
☢☢☢☢	10-30 mSv	3-10 mSv
☢☢☢☢☢	30-100 mSv	10-30 mSv
*RRL assignments for some of the examinations cannot be made, because the actual patient doses in these procedures vary as a function of a number of factors (e.g., region of the body exposed to ionizing radiation, the imaging guidance that is used). The RRLs for these examinations are designated as "Varies."		

Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

Scope

Disease/Condition(s)

Acute nonspecific chest pain with low probability of coronary artery disease (CAD)

Guideline Category

Diagnosis

Evaluation

Clinical Specialty

Cardiology

Emergency Medicine

Family Practice

Internal Medicine

Nuclear Medicine

Radiology

Intended Users

Advanced Practice Nurses

Health Plans

Hospitals

Managed Care Organizations

Physician Assistants

Physicians

Students

Utilization Management

Guideline Objective(s)

To outline the usefulness of available diagnostic imaging for those patients without known coronary artery disease (CAD) and at low probability for having CAD who do not present with classic acute coronary syndrome (ACS) signs, symptoms, or electrocardiogram (ECG) abnormalities, but rather with nonspecific chest pain leading to a differential diagnosis including aortic, pulmonary, gastrointestinal (GI), or musculoskeletal pathologies

Target Population

Patients with acute nonspecific chest pain with low probability of coronary artery disease (CAD)

Note: Patients presenting to the emergency department (ED) with classic signs and/or symptoms of acute coronary syndrome (ACS), including those with unstable angina pectoris, non–ST-elevation myocardial infarction, diagnostic ST-segment changes, or elevated cardiac enzymes suggesting myocardial infarction, are not included in this discussion. The evaluation and treatment algorithms for these conditions have been well defined in the Scientific Statements and Practice Guidelines of the American Heart Association and in the National Guideline Clearinghouse (NGC) summary of the ACR Appropriateness Criteria® chest pain suggestive of acute coronary syndrome.

Interventions and Practices Considered

1. X-ray
    - Chest
    - Barium swallow and upper gastrointestinal (GI) series
    - Rib views
    - Thoracic spine
2. Computed tomography angiography (CTA)
    - Coronary arteries with contrast
    - Chest with contrast
3. Magnetic resonance imaging (MRI)
    - Heart stress perfusion without and with contrast
    - Heart function and morphology without and with contrast
    - Heart function and morphology without contrast
4. Magnetic resonance angiography (MRA)
    - Chest without and with contrast
    - Chest without contrast
5. Ultrasound (US)
    - Transthoracic resting echocardiography
    - Transesophageal echocardiography
    - Transthoracic stress echocardiography
    - Abdomen
6. Single-photon emission computed tomography (SPECT), myocardial perfusion imaging (MPI), rest and stress
7. Technetium (Tc)-99m ventilation/perfusion (V/Q) scan, lung
8. Coronary arteriography

Major Outcomes Considered

- Utility of diagnostic imaging studies in the evaluation of patients with acute nonspecific chest pain and low probability of coronary artery disease (CAD)
- Sensitivity, specificity, positive and negative predictive values, and diagnostic yield of imaging studies in the evaluation of patients with acute nonspecific chest pain and low probability of CAD

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search Summary

Of the 56 citations in the original bibliography, 37 were retained in the final document. Articles were removed from the original bibliography if they were more than 10 years old and did not contribute to the evidence or they were no longer cited in the revised narrative text.

A new literature search was conducted in December 2013 to identify additional evidence published since the *ACR Appropriateness Criteria® Acute Nonspecific Chest Pain-Low Probability of Coronary Artery Disease* topic was finalized. Using the search strategy described in the literature search companion (see the "Availability of Companion Documents" field), 93 articles were found. Two articles were added to the bibliography. Ninety-one articles were not used due to either poor study design, the articles were not relevant or generalizable to the topic, the results were unclear, misinterpreted, or biased, or the articles were already cited in the original bibliography.

The author added 16 citations from bibliographies, Web sites, or books that were not found in the new literature search. One citation is a supporting document that was added by staff.

See also the American College of Radiology (ACR) Appropriateness Criteria® literature search process document (see the "Availability of Companion Documents" field) for further information.

Number of Source Documents

Of the 56 citations in the original bibliography, 37 were retained in the final document. The new literature search conducted in December 2013 identified two articles that were added to the bibliography. The author added 16 citations from bibliographies, websites, or books that were not found in the new literature search. One citation is a supporting document that was added by staff.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Definitions of Study Quality Categories

Category 1 - The study is well-designed and accounts for common biases.

Category 2 - The study is moderately well-designed and accounts for most common biases.

Category 3 - The study has important study design limitations.

Category 4 - The study or source is not useful as primary evidence. The article may not be a clinical study, the study design is invalid, or conclusions are based on expert consensus.

The study does not meet the criteria for or is not a hypothesis-based clinical study (e.g., a book chapter or case report or case series description);

Or

The study may synthesize and draw conclusions about several studies such as a literature review article or book chapter but is not primary evidence;

Or

The study is an expert opinion or consensus document.

Category M - Meta-analysis studies are not rated for study quality using the study element method because the method is designed to evaluate individual studies only. An "M" for the study quality will indicate that the study quality has not been evaluated for the meta-analysis study.

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The topic author assesses the literature then drafts or revises the narrative text summarizing the evidence found in the literature. American College of Radiology (ACR) staff drafts an evidence table based on the analysis of the selected literature. These tables rate the study quality for each article included in the narrative.

The expert panel reviews the narrative, evidence table, and the supporting literature for each of the topic-variant combinations and assigns an appropriateness rating for each procedure listed in the variant table(s). Each individual panel member assigns a rating based on his/her interpretation of the available evidence.

More information about the evidence table development process can be found in the ACR Appropriateness Criteria® Evidence Table Development document (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

Rating Appropriateness

The American College of Radiology (ACR) Appropriateness Criteria (AC) methodology is based on the RAND/UCLA Appropriateness Method. The appropriateness ratings for each of the procedures or treatments included in the AC topics are determined using a modified Delphi method. An initial survey is conducted to elicit each panelist's expert interpretation of the evidence, based on the available data, regarding the appropriateness of an imaging or therapeutic procedure for a specific clinical scenario. The expert panel members review the evidence presented and assess the risks or harms of doing the procedure balanced with the benefits of performing the procedure. The direct or indirect costs of a procedure are not considered as a risk or harm when determining appropriateness (additional assumptions regarding rating appropriateness can be found in the document Rating Round Information). When the evidence for a specific topic and variant is uncertain or incomplete, expert opinion may supplement the available evidence or may be the sole source for assessing the appropriateness.

The appropriateness is represented on an ordinal scale that uses integers from 1 to 9 grouped into three categories: 1, 2, or 3 are in the category "usually not appropriate" where the harms of doing the procedure outweigh the benefits; and 7, 8, or 9 are in the category "usually appropriate" where the benefits of doing a procedure outweigh the harms or risks. The middle category, designated "may be appropriate," is represented by 4,

5, or 6 on the scale. The middle category is when the risks and benefits are equivocal or unclear, the dispersion of the individual ratings from the group median rating is too large (i.e., disagreement), the evidence is contradictory or unclear, or there are special circumstances or subpopulations which could influence the risks or benefits that are embedded in the variant.

The ratings assigned by each panel member are presented in a table displaying the frequency distribution of the ratings without identifying which members provided any particular rating. To determine the panel's recommendation, the rating category that contains the median group rating without disagreement is selected. This may be determined after either the first or second rating round. If there is disagreement after the first rating round, a conference call is scheduled to discuss the evidence and, if needed, clarify the variant or procedure description. If there is still disagreement after the second rating round, the recommendation is "may be appropriate."

This modified Delphi method enables each panelist to articulate his or her individual interpretations of the evidence or expert opinion without excessive influence from fellow panelists in a simple, standardized, and economical process. For additional information on the ratings process see the Rating Round Information document.

Additional methodology documents, including a more detailed explanation of the complete topic development process and all ACR AC topics can be found on the ACR Web site (see also the "Availability of Companion Documents" field).

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The recommendations are based on analysis of the current medical evidence literature and the application of the RAND/UCLA appropriateness method and expert panel consensus.

Summary of Evidence

Of the 56 references cited in the *ACR Appropriateness Criteria® Acute Nonspecific Chest Pain-Low Probability of Coronary Artery Disease* document, 55 are categorized as diagnostic references including 5 well designed studies, 13 good quality studies, and 18 quality studies that may have design limitations. Additionally, 1 reference is categorized as a therapeutic reference. There are 20 references that may not be useful as primary evidence.

While there are references that report on studies with design limitations, 18 well designed or good quality studies provide good evidence.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Selection of appropriate diagnostic imaging procedures for evaluation of patients without known coronary artery disease (CAD) and at low probability for having CAD who do not present with classic acute coronary syndrome (ACS) signs, symptoms, or electrocardiogram (ECG) abnormalities, but rather with nonspecific chest pain

Potential Harms

There is rarely an indication to use cardiac catheterization with coronary digital subtraction angiography in low-probability patients because of the unfavorable risk-benefit ratio (0.46% major complication rate in diagnostic angiography, consisting of 0.13% death, 0.06% myocardial infarction, 0.08% stroke, 0.07% major bleeding [>2 units], and 0.12% severe renal failure [>50% decrease in GFR]).

Relative Radiation Level

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Patients in the pediatric age group are at inherently higher risk from exposure, both because of organ sensitivity and longer life expectancy (relevant to the long latency that appears to accompany radiation exposure). For these reasons, the RRL dose estimate ranges for pediatric examinations are lower as compared to those specified for adults. Additional information regarding radiation dose assessment for imaging examinations can be found in the ACR Appropriateness Criteria® Radiation Dose Assessment Introduction document (see the "Availability of Companion Documents" field).

Qualifying Statements

Qualifying Statements

- The American College of Radiology (ACR) Committee on Appropriateness Criteria (AC) and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those examinations generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.
- ACR seeks and encourages collaboration with other organizations on the development of the ACR AC through society representation on expert panels. Participation by representatives from collaborating societies on the expert panel does not necessarily imply society endorsement of the final document.
- The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or reflecting the views of the Uniformed Services University of the Health Sciences or the Department of Defense.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Hoffman U, Akers SR, Brown RK, Cummings KW, Cury RC, Greenberg SB, Ho VB, Hsu JY, Min JK, Panchal KK, Stillman AE, Woodard PK, Jacobs JE, Expert Panel on Cardiac Imaging. ACR Appropriateness CriteriaÂ® acute nonspecific chest pain - low probability of coronary artery disease. Reston (VA): American College of Radiology (ACR); 2015. 8 p. [56 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2015

Guideline Developer(s)

American College of Radiology - Medical Specialty Society

Source(s) of Funding

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

Guideline Committee

Committee on Appropriateness Criteria, Expert Panel on Cardiac Imaging

Composition of Group That Authored the Guideline

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Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Hoffman U, Venkatesh V, White RD, Woodard PK, Carr JJ, Dorbala S, Earls JP, Jacobs JE, Mammen L, Martin ET III, Ryan T, White CS, Expert Panel on Cardiac Imaging. ACR Appropriateness Criteria® acute nonspecific chest pain - low probability of coronary artery disease. [online publication]. Reston (VA): American College of Radiology (ACR); 2011. 6 p. [56 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the American College of Radiology (ACR) Web site .

Availability of Companion Documents

The following are available:

- ACR Appropriateness Criteria®. Overview. Reston (VA): American College of Radiology; 2015 Oct. 3 p. Available from the American College of Radiology (ACR) Web site .
- ACR Appropriateness Criteria®. Literature search process. Reston (VA): American College of Radiology; 2015 Feb. 1 p. Available from the ACR Web site .
- ACR Appropriateness Criteria®. Evidence table development. Reston (VA): American College of Radiology; 2015 Nov. 5 p. Available from the ACR Web site .
- ACR Appropriateness Criteria®. Topic development process. Reston (VA): American College of Radiology; 2015 Nov. 2 p. Available from the ACR Web site .
- ACR Appropriateness Criteria®. Rating round information. Reston (VA): American College of Radiology; 2015 Apr. 5 p. Available from the ACR Web site .
- ACR Appropriateness Criteria®. Radiation dose assessment introduction. Reston (VA): American College of Radiology; 2015 Sep. 3 p. Available from the ACR Web site .
- ACR Appropriateness Criteria® acute nonspecific chest pain — low probability of coronary artery disease. Evidence table. Reston (VA): American College of Radiology; 2015. 28 p. Available from the ACR Web site .
- ACR Appropriateness Criteria® acute nonspecific chest pain — low probability of coronary artery disease. Literature search. Reston (VA): American College of Radiology; 2015. 1 p. Available from the ACR Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI on February 20, 2001. The information was verified by the guideline developer on March 14, 2001. This summary was updated by ECRI on July 31, 2002. The updated information was verified by the guideline developer on October 1, 2002. This summary was updated by ECRI on March 17, 2006. This summary was updated by ECRI Institute on July 12, 2007 following the U.S. Food and Drug Administration (FDA) advisory on Troponin-1 Immunoassay. This summary was completed by ECRI Institute on September 9, 2009. This summary was updated by ECRI Institute on January 13, 2011 following the U.S. Food and Drug Administration (FDA) advisory on gadolinium-based contrast agents. This summary was completed by ECRI Institute on February 7, 2012. This summary was updated by ECRI Institute on January 20, 2016.

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